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13. ABSTRACT *(Maximum 200 words)*

THE PURPOSE OF THIS FINAL IMPLEMENTATION DOCUMENT IS TO OUTLINE THE BASIS AND PLAN FOR DECONTAMINATION, DISMANTLEMENT, AND DISPOSAL OF STRUCTURES, PIPING, AND EQUIPMENT AT THE HYDRAZINE BLENDING AND STORAGE FACILITY.

THE REPORT IS DIVIDED INTO THE FOLLOWING SECTIONS:

1. INTRODUCTION - HISTORY OF THE FACILITY, SUMMARY OF THE SCOPE OF WORK, PRIMARY OBJECTIVES OF THE IRA
2. SITE INVENTORY - TANKS, PIPING, BUILDINGS, ASBEST, DEBRIS, DRUMS
3. PLAN OF ACTION - TRANSFER OF UNTREATED WASTEWATER, DECONTAMINATION, DEMOLITION, TRANSPORT, AND DISPOSAL

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Hydrazine Blending and Storage Facility
Interim Response Action
Final Implementation Document for Decommissioning (Phase I)

March 18, 1991
Contract Number DAAA15-88-0021
Task IRA H Phase I (Delivery Order 0003)

PREPARED BY

HARDING LAWSON ASSOCIATES

PREPARED FOR

PROGRAM MANAGER FOR ROCKY MOUNTAIN ARSENAL

THIS DOCUMENT IS INTENDED TO COMPLY WITH THE NATIONAL ENVIRONMENTAL POLICY ACT OF 1969.

THE INFORMATION AND CONCLUSIONS PRESENTED IN THIS REPORT REPRESENT THE OFFICIAL POSITION OF THE DEPARTMENT OF THE ARMY UNLESS EXPRESSLY MODIFIED BY A SUBSEQUENT DOCUMENT. THIS REPORT CONSTITUTES THE RELEVANT PORTION OF THE ADMINISTRATION RECORD FOR THIS CERCLA OPERABLE UNIT.

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EXECUTIVE SUMMARY

This Final Implementation Document (ID) for Decommissioning has been prepared as a requirement for conduct and completion of Phase I of the Interim Response Action (IRA) H at the Hydrazine Blending and Storage Facility (HBSF) located at Rocky Mountain Arsenal (RMA) in Commerce City, Colorado. It was developed in accordance with requirements set forth in the Final Decision Document for the IRA (Ebasco, 1988). The HBSF IRA task was separated into two phases that comprise the closure of the HBSF.

The design portion of Phase I of the HBSF IRA included analytical methods development and laboratory certification for analysis of hydrazine fuel compounds (hydrazine, monomethyl hydrazine [MMH], and unsymmetrical dimethyl hydrazine [UDMH]) and n-nitrosodimethylamine (NDMA) in wastewater stored at the HBSF, bench/pilot-scale testing of ultraviolet (UV)/chemical oxidation treatment systems for treatment of hydrazine wastewater, full-scale startup testing of a UV/chemical oxidation treatment system, and air monitoring during startup testing as described in the Draft Final Treatment Report (HLA, 1991).

An inventory of the HBSF site was also conducted during Phase I to assess overall site conditions and to inventory facilities and equipment at the site for planning of decontamination, demolition, and reclamation decommissioning activities. The inventory identified aboveground tanks and piping, buried structures and piping, drums, concrete and asphalt, buildings, and surficial debris. An asbestos survey was also performed during the site inventory.

In addition, decommissioning of the HBSF will be conducted under Phase I (PMRMA, December 1990). Decommissioning will address the 36 specific decommissioning activities described in the Final Decision Document and will include (1) cleaning or decontamination of contaminated drums, piping, structures, tanks, the in-ground concrete sump, and secondary containment structures associated with various tanks at the HBSF, (2) demolition of aboveground piping, structures, tanks, buildings, fences, power poles, railroad tracks and support ties, asphalt, and concrete surfaces, (3) excavation and demolition of in-ground concrete secondary containment structures and the in-ground concrete sump, (4) removal of asbestos and other insulation, (5)

removal of underground piping and conduits, (6) transport and disposal of decommissioned materials to hazardous and nonhazardous waste disposal facilities, and (7) site reclamation. Phase I will be completed by December 1, 1991. The purpose of this Final ID is to outline the basis and plan for decommissioning of the HBSF.

1.0 INTRODUCTION

This Final Implementation Document (ID) has been prepared as a requirement for conduct and completion of Phase I of the Interim Response Action (IRA) H at the Hydrazine Blending and Storage Facility (HBSF) located at Rocky Mountain Arsenal (RMA) approximately 10 miles northeast of metropolitan Denver, Colorado (Figure 1.1). This document was prepared in accordance with requirements set forth in the Final Decision Document for the IRA (Ebasco, 1988).

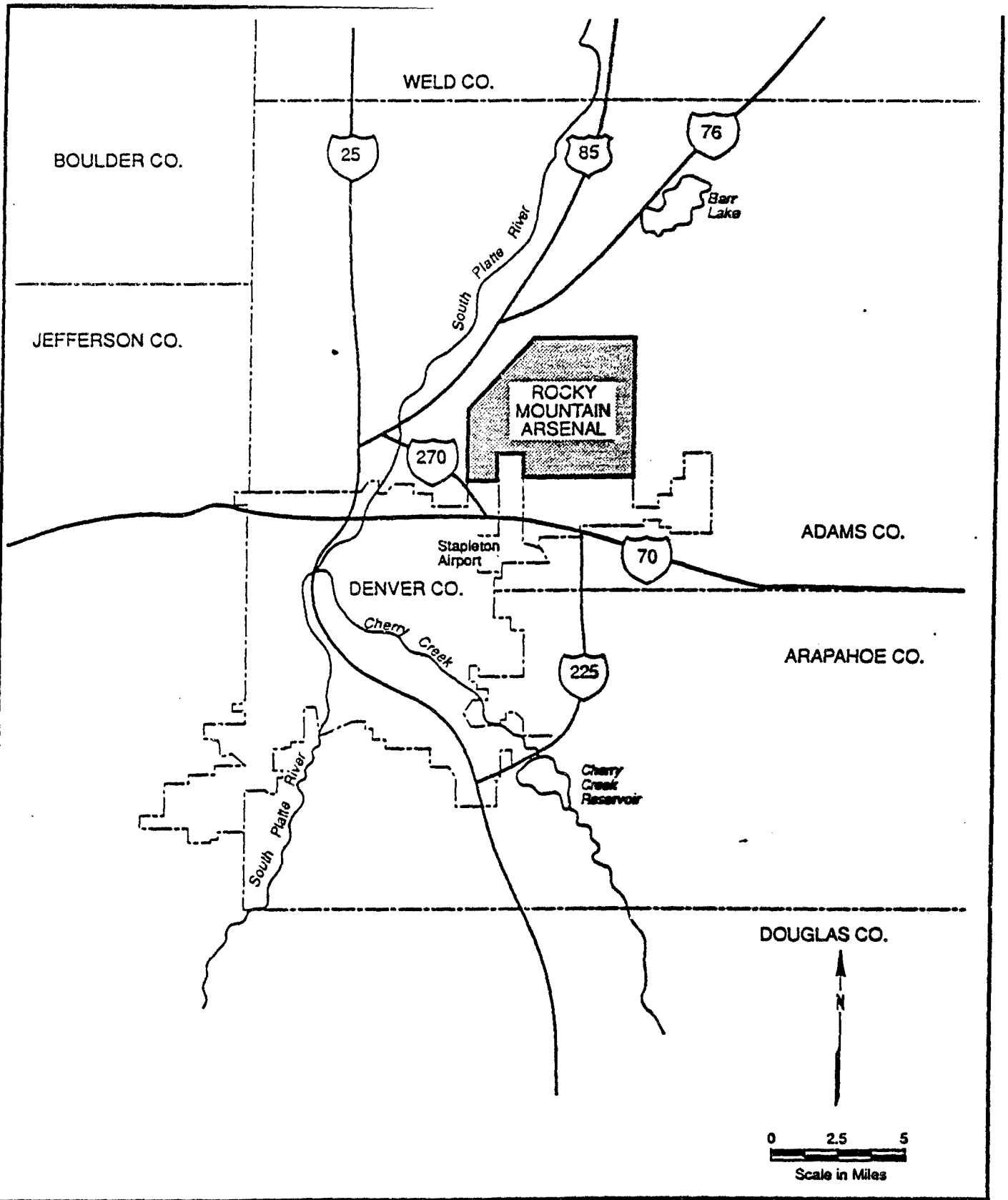
The purpose of this Final ID is to outline the basis and plan for decontamination, dismantlement, and disposal of structures, piping, and equipment for decommissioning of the HBSF. This section presents a brief description and history of the HBSF, a summary of the Decision Document, a summary of the scope of work for the IRA, and primary objectives of the IRA: Section 2.0 presents results of a site inventory conducted in preparation for decommissioning the HBSF. A plan of action for decommissioning the HBSF is presented in Section 3.0.

1.1 BACKGROUND

1.1.1 HBSF History

The HBSF, which was operated by RMA for the U.S. Air Force (USAF) between 1962 and May 1982, is located east of the South Plants area in the northeast corner of Section 1 at RMA (Figure 1.2). The 10-acre site consists of two tank yards, each completely surrounded by security fencing. The yards are connected by two overhead pipelines.

The HBSF was used as a depot to receive, blend, store, and distribute hydrazine fuel compounds manufactured elsewhere. The primary operation was blending of anhydrous hydrazine and unsymmetrical dimethyl hydrazine (UDMH) (or 1,1-dimethyl hydrazine) to produce Aerozine 50. The materials were manufactured elsewhere and shipped to RMA for blending. Blending operations were not continuous and occurred in response to requests by the USAF. Other operations at the HBSF included loading and unloading of rail cars and tanker trucks,



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Commerce City, Colorado

Figure 1.1

RMA LOCATION MAP

RMAB 1003

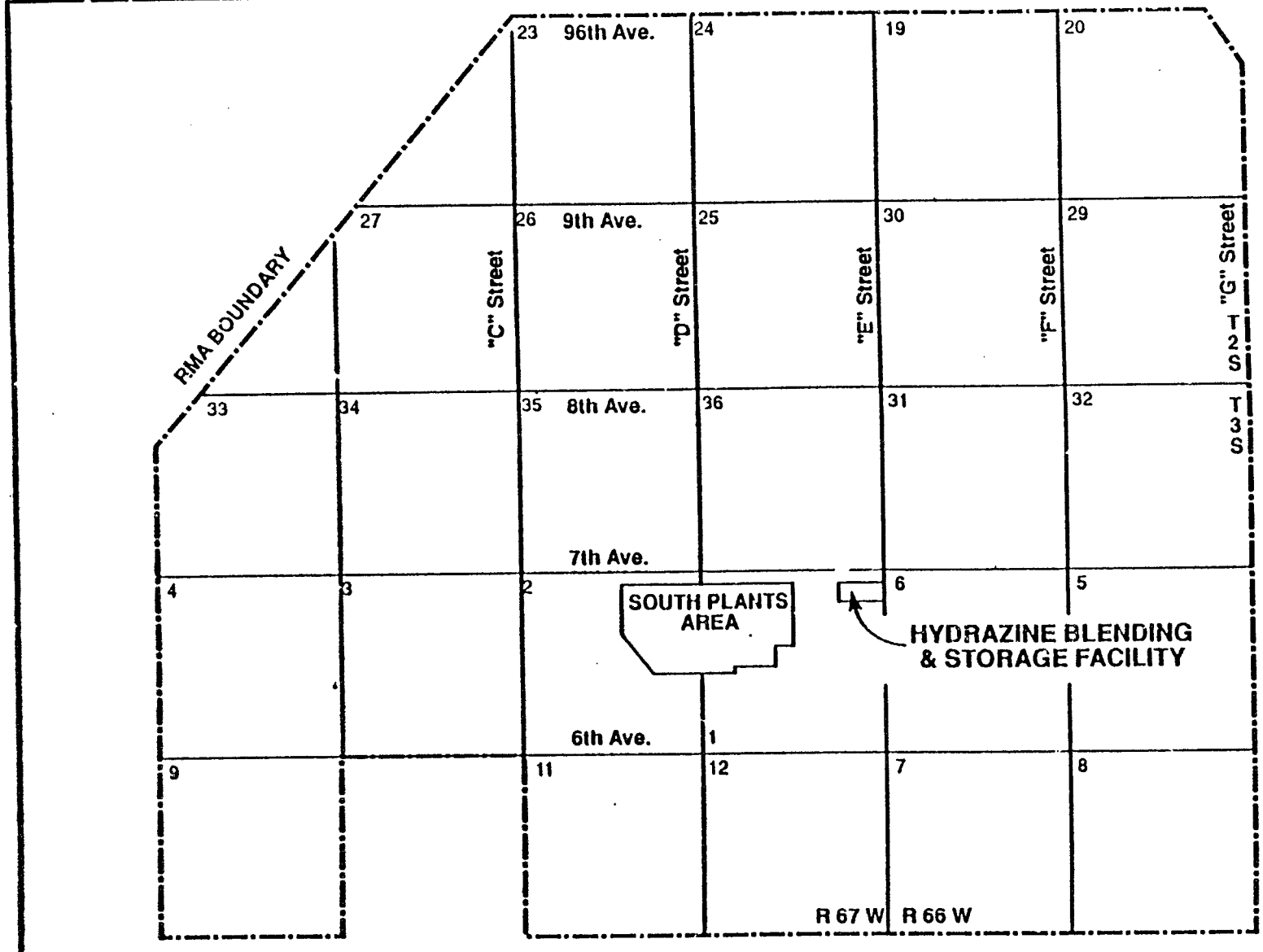


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Figure 1.2

LOCATION OF HYDRAZINE BLENDING AND STORAGE FACILITY AT RMA

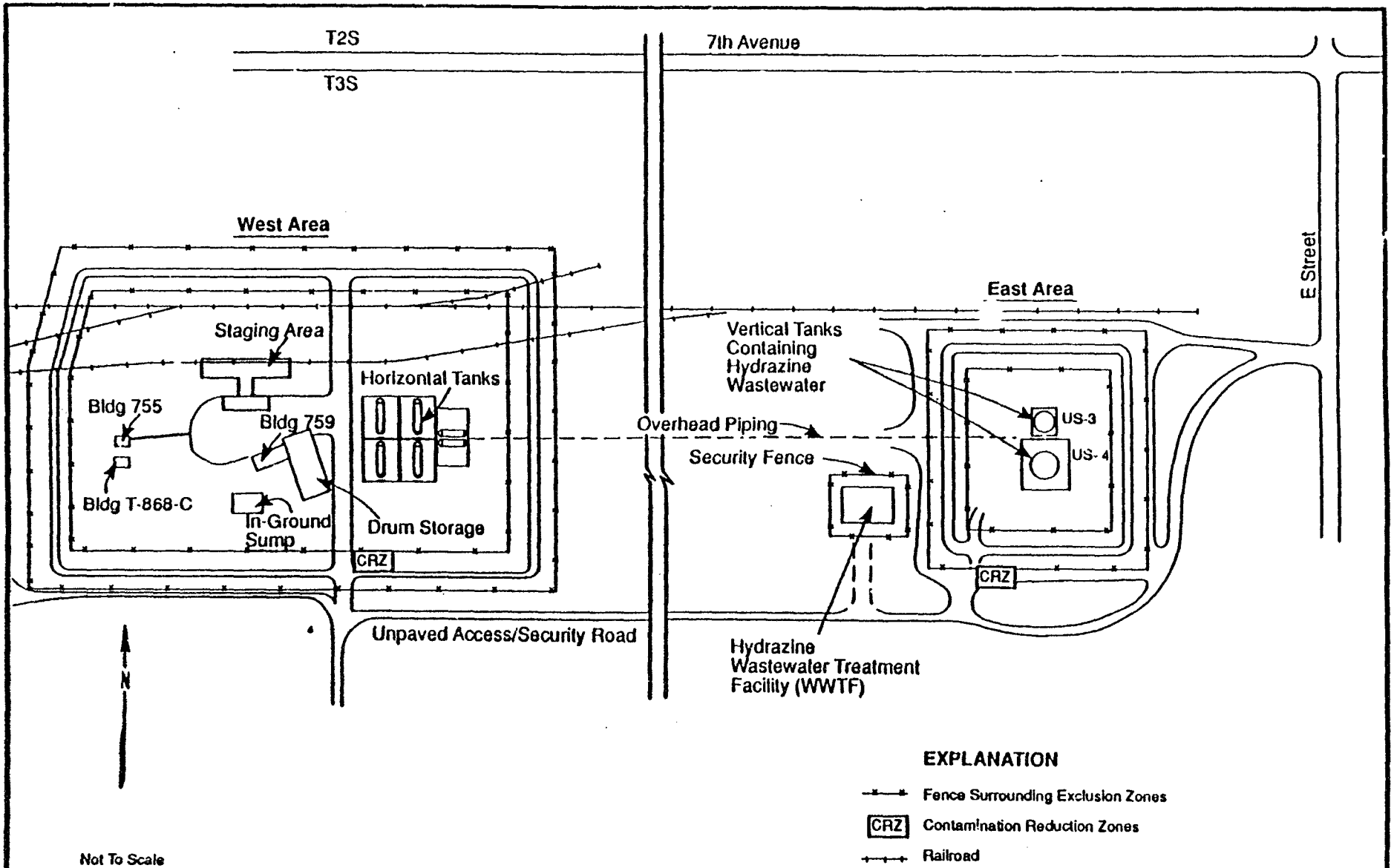
destruction of off-specification Aerozine 50, and storage of Aerozine 50, anhydrous hydrazine, monomethyl hydrazine (MMH), monopropellent hydrazine, hydrazine 70, UDMH, and hydrazine.

Hydrazine and UDMH are unstable in the natural environment and rapidly decompose when exposed to the atmosphere. One of the decomposition products of UDMH is n-nitrosodimethylamine (NDMA), a suspected human carcinogen. From January through March 1982, the U.S. Occupational Safety and Health Administration (OSHA) surveyed the HBSF and detected the presence of airborne NDMA within the HBSF. In May 1982, RMA ceased operations and closed the HBSF to all but safety-essential or emergency-response entries.

Following the discontinuation of operations at the HBSF, tanks that were used to store hydrazine fuel compounds were decontaminated. The decontamination procedure consisted of pumping a sodium hypochlorite solution through horizontal hydrazine fuel storage tanks HAS-1, HAS-2, HAS-3, CS-1, US-1, and US-2 located at the west area of the HBSF. The decontamination solution was subsequently pumped into tanks US-3 and US-4 located at the east area of the HBSF. In addition, an in-ground concrete sump located in the west area of the HBSF received water used to decontaminate various portions of the HBSF (Figure 1.3). Secondary containment structures associated with hydrazine fuel storage tanks HAS-1, HAS-2, HAS-3, CS-1, US-1, and US-2 are connected to the in-ground concrete sump via buried pipelines. Volumes of wastewater currently stored in tanks US-3, US-4, and the in-ground concrete sump are approximately 50,000 gallons, 200,000 gallons, and 40,000 gallons, respectively.

On February 1, 1988, a proposed Consent Decree was filed in the case of *U.S. v. Shell Oil Company* with the U.S. District Court in Denver, Colorado. A modified version of the Consent Decree was filed on June 7, 1988. On February 17, 1989, a Federal Facility Agreement (FFA) that incorporates the provisions of the modified Consent Decree was executed by the U.S. Department of the Army (Army), Shell Oil Company, the U.S. Environmental Protection Agency (EPA), the U.S. Department of the Interior (DOI), the U.S. Department of Justice (DOJ), and the U.S. Department of Health and Human Services (DHHS). The FFA specifies a number of IRAs, including Closure of the HBSF, as necessary and appropriate before final remedial action at RMA.

RMAH 1005



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Figure 1.3

HYDRAZINE BLENDING AND STORAGE FACILITY MAP

2A

The IRA process described in the FFA requires preparation of an IRA Implementation Document before implementation of the response action.

1.1.2 Decision Document

In October 1988, the Final Decision Document for the IRA was released by the Program Manager for RMA (PMRMA). The Decision Document states that the objectives of the HBSF IRA are to meet the following specific criteria:

- Treat wastewater to levels that will effectively eliminate any substantial risks to human health and the environment associated with the contaminants of concern, including hydrazine, MMH, UDMH, and NDMA
- Use treatment technology that is technically feasible and readily implementable
- Achieve permanent remediation through destruction of contaminants of concern to designated action levels or reduce the toxicity, mobility, or volume of wastewater
- Be cost-effective
- Comply with designated applicable or relevant and appropriate requirements (ARARs) to the maximum extent practicable

The Decision Document further addresses 36 specific decommissioning activities.

1.2 SCOPE OF WORK/OBJECTIVES

The HBSF IRA task was separated into two phases that comprise the closure of the HBSF at RMA. Phase I included planning, wastewater treatment system selection and modification (including bench/pilot-scale testing), full-scale system installation, analytical method development and laboratory method certification, treatment system startup testing, and development of this ID for decontamination, demolition, and disposal of structures and equipment at the HBSF and site reclamation (decommissioning). Phase I will conclude with the completion of decommissioning activities. Phase II will include full-scale operational treatment and disposal of hydrazine wastewater (1) stored at the HBSF and (2) generated during decommissioning activities.

Consistent with the overall IRA objectives cited in the Decision Document, the following specific objectives were developed for Phase I:

- Conduct a bench-scale testing program to evaluate whether qualified manufacturers of ultraviolet (UV)/chemical oxidation equipment could reduce the concentrations of NDMA and hydrazine fuel compounds (hydrazine, UDMH, and MMH) present in wastewater stored at the HBSF to concentrations near the action levels identified in the Final Decision Document

- Select an appropriate UV/chemical oxidation treatment system for treatment of hydrazine wastewater stored at the HBSF

- Evaluate necessary treatment system modifications to achieve the desired discharge concentrations for the chemicals of concern in the wastewater

- Develop and certify an analytical method for analysis of NDMA in treated wastewater to attain the lowest technologically achievable Certified Reporting Limit (CRL)

- Design and construct a full-scale UV/chemical oxidation treatment system and conduct full-scale startup testing using approximately 10,000 gallons of the hydrazine wastewater

- Gather sufficient process information from the startup testing to more specifically define operational treatment requirements to predict treatment time necessary to achieve action levels identified in the Decision Document for this IRA

- Decontaminate, dismantle, and dispose structures, piping, and equipment at the HBSF

The primary objectives of Phase II of the IRA are as follows:

- Treat and dispose the remaining hydrazine wastewater stored at the HBSF and the wastewater generated during decommissioning of the HBSF

- Treat and dispose any sludge remaining in the hydrazine wastewater storage tanks upon completion of wastewater treatment

2.0 SITE INVENTORY

During the week of October 30, 1989, an inventory of the HBSF site was conducted. The purpose of the inventory was to review previous investigation reports, verify the reasonableness of quantity estimates from those investigations, and assess overall site conditions to address the decontamination, demolition, and restoration of the HBSF site. Quantities, condition, and materials of construction of aboveground and buried piping, tanks, structures, and other facilities were assessed. This section describes the results of the site inventory.

2.1 ABOVEGROUND TANKS

Aboveground storage tanks of varying sizes were identified at the HBSF. These tanks currently contain contaminated liquids, or were reported to contain contaminated liquids at one time. Table 2.1 lists these tanks and indicates their respective tank identification numbers, sizes, types of construction, and locations.

The condition of the six horizontal tanks (HAS-1, HAS-2, HAS-3, CS-1, US-1, and US-2) previously used to store hydrazine fuels in the west area of the HBSF was not determined because each of these tanks is surrounded by an antifreeze/cooling system. The tanks were reported to be empty, but the antifreeze/cooling systems were judged to still contain approximately 4500 gallons total of ethylene glycol. All of the secondary containment structures for the six horizontal storage tanks were noted to have numerous surficial cracks in the concrete floors and open cracks at the concrete wall construction joints. Cracks at the construction joints were as large as 1/8-inch wide and extended through the secondary containment concrete walls.

The inspection of tanks US-3 and US-4, located in the east area of the HBSF, was limited because of the presence of insulation around the outside of the tanks. The insulation on these tanks is composed of foam and is severely weathered and in a state of disrepair. The concrete secondary containment structures of both tanks contained floor cracks. It is not known whether the cracks extend through the containment structures. The walls of the secondary containment structure for tank US-4 also contained cracks that may extend through the walls. No cracks were

Table 2.1: Inventory of Aboveground Storage Tanks and the In-Ground Concrete Sump at the Hydrazine Blending and Storage Facility

Tank	Description	Location
HAS-1	Elevated horizontal tank, formerly contained hydrazine or aerozine, 24,900-gallon capacity, stainless steel, insulation and metal jacket around outside	West area
HAS-2	Elevated horizontal tank, formerly contained hydrazine or aerozine, 24,900-gallon capacity, stainless steel, insulation and metal jacket around outside	West area
HAS-3	Elevated horizontal tank, formerly contained hydrazine or aerozine, 24,900-gallon capacity, stainless steel, insulation and metal jacket around outside	West area
CS-1	Elevated horizontal tank, formerly contained hydrazine, 24,900-gallon capacity, stainless steel, insulation and metal jacket around outside	West area
US-1	Elevated horizontal tank, formerly contained UDMH, 19,000-gallon capacity, carbon steel, insulation and metal jacket around outside	West area
US-2	Elevated horizontal tank, formerly contained UDMH, 19,000-gallon capacity, carbon steel, insulation and metal jacket around outside	West area
US-3	Vertical tank, contains hydrazine wastewater, 50,000-gallon capacity, carbon steel, foam insulation around outside	East area
US-4	Vertical tank, contains hydrazine wastewater, 200,000-gallon capacity, carbon steel, foam insulation around outside	East area
In-ground concrete sump	Subsurface open-top sump, contains hydrazine wastewater, 44,000-gallon capacity	West area

UDMH = unsymmetrical dimethyl hydrazine

noted in the walls of the secondary containment structure for tank US-3. Since the initial inspection, tanks US-3 and US-4 and their secondary containment structures have been inspected daily (five days/week), except during January 1990 when weather conditions and personnel availability limited daily inspection. In addition, the cracks in the secondary containment structures were sealed during June 1990 to reduce risk in the event of a loss of material from US-3 or US-4.

After a visual inspection of the tanks was performed, air samples were taken within the tanks and analyzed for hydrazine using Draeger tubes. The following observations were recorded:

- HAS-1, HAS-2, HAS-3, CS-1 - Bottom valves are open and the tanks are free of liquid, sludge, or scale. Results of the Draeger tube analysis indicated hydrazine was not detected at or above the detection limit of 0.05 parts per million (ppm) hydrazine.
- US-1 - Bottom valve is open and tank contains approximately 1 inch of rusty scale and sludge on the bottom. Draeger tube analysis results of the air samples taken within the tank were below the detection limit for hydrazine.
- US-2 - Bottom valve is open and tank contains approximately 1 inch of rusty scale and sludge on the bottom. Draeger tube analysis results of the air samples taken within the tank revealed 0.75 ppm hydrazine.
- US-3 - Tank is full to within 10 inches of top. Draeger tube analysis results of air samples taken within the tank revealed 5.2 ppm hydrazine.
- US-4 - Liquid level in tank is approximately 2 feet from top of tank.

As mentioned previously, the antifreeze/coolant systems surrounding the six horizontal tanks in the west area of the HBSF were suspected of containing approximately 4500 gallons total of ethylene glycol antifreeze. The antifreeze/coolant systems were drained on January 16, 1990. Ethylene glycol was drained into 550-gallon and 300-gallon high-density polyethylene (HDPE) tanks mounted on pallets. A total of nine 550-gallon tanks and eight 300-gallon tanks were filled with ethylene glycol from the system. The total volume of ethylene glycol collected during this task was approximately 7400 gallons. After the HDPE tanks were filled with ethylene glycol and assigned individual tracking numbers, they were transferred to storage in RMA Warehouse 786. The ethylene glycol was not analyzed for the hydrazine fuel compounds because a method for analysis of the hydrazine fuel compounds in glycol does not exist. During decommissioning, the ethylene glycol will be characterized to determine appropriate offsite disposition.

2.2 ABOVEGROUND PIPING

Approximately 10,285 linear feet of aboveground piping exists at the HBSF. Pipe diameters, materials of construction, and respective lengths are detailed in Table 2.2. This estimate includes process piping and piping associated with the fire deluge system. During the site inventory, a color-code system was implemented to identify and inventory piping. This system will be used for identification during the decontamination and demolition activities. The color-code system is as follows:

- Blue - water
- White - steam/heat
- Green - ethylene glycol
- Yellow - UDMH
- Red - hydrazine
- Orange - aerozine
- Gray - contaminated waste line

2.3 BURIED STRUCTURES

Although no buried tanks were identified at the HBSF, a 44,000-gallon capacity in-ground concrete waste sump is located in the west area (see Figure 1.3). The sump currently contains approximately 40,000 gallons of liquid. The liquid was apparently drained to the sump when RMA personnel flushed the piping systems following shutdown of the HBSF. As indicated on record drawings for the HBSF, liquids enter the sump from underground drainage lines.

2.4 BURIED PIPING

Record drawings indicate that buried piping at the HBSF consists primarily of drainage and water or fire-suppression water supply lines. As indicated in Table 2.2, an approximate estimate of the length of buried piping is 2,918 linear feet.

Table 2.2: Piping Inventory - West Area of the Hydrazine Blending and Storage Facility

Aboveground Piping	Estimated Linear Feet	Estimated Weight (tons)	Estimated Cubic Yards
1/2-inch-diameter copper and steel	3,572	1.5	
1-inch-diameter steel	1,027	0.9	
1-1/2-inch-diameter steel	422	0.6	
2-inch-diameter steel	1,079	2.0	
2-1/2-inch-diameter steel	2,066	6.0	
3-inch-diameter steel	1,528	5.8	
4-inch-diameter steel	363	2.0	
6-inch-diameter steel	228	2.2	
Subtotal	10,285	21.0	
Buried Piping			
2-inch-diameter stainless-steel	395	0.72	
2-inch-diameter PVC	105		0.13
2-1/2-inch-diameter PVC	825		1.60
2-1/2-inch-diameter stainless-steel	370	1.10	
3-inch-diameter iron	460	1.74	
4-inch-diameter iron	372	2.00	
4-inch-diameter tile	195		0.94
6-inch-diameter iron	110	1.04	
6-inch-diameter asbestos cement	86		0.93
Subtotal (estimated quantity)	2,918	6.60	3.60

PVC = polyvinyl chloride

2.5 ASBESTOS

Based on the asbestos survey performed from June 26 through June 28, 1989, chrysotile and amosite asbestos were detected in 23 of 48 samples collected from insulation around various piping, tanks, and other vessels at the HBSF. Specific asbestos sampling locations and associated results are described in Table 2.3.

Bulk samples were collected using a 3/8-inch cordless drill and 1/4-inch aluminum tubing. The tubing was drilled through a wet sponge into the suspected asbestos-containing material (ACM) to prevent the potential release of asbestos fibers. Samples were placed in numbered bags and logged, and the sample areas were sealed with duct tape and numbered with the corresponding sample number. A red dot was spray-painted on each sampling location for ease of locating the sample areas during decommissioning of the HBSF.

The samples were sent to Hager Laboratories, Inc., in Denver, Colorado, for analysis using polarized light microscopy (PLM). Of the 48 samples collected, 23 samples were reported as containing greater than 1 percent asbestos, the Colorado regulatory definition of ACM. As indicated in Table 2.3, most ACM samples were obtained from piping tees and elbows.

2.6 BUILDINGS

Three buildings, including a pump house (Building 755), a maintenance house (Building 759), and an unidentified building (Building T-868-C) hereafter called the South Metal Building, are located in the west area of the HBSF. The locations of the buildings are shown in Figure 1.3. A physical inventory of each building was conducted. The results of the inventories are presented in Tables 2.4, 2.5, and 2.6 for Building 755, Building 759, and the South Metal Building, respectively. It was concluded during the inventory of HBSF facilities that electrical power is available at both the pump house and South Metal Building. A working telephone is also present in the pump house. The South Metal Building contains a floor drain. Record drawings indicate that the drain is routed to the in-ground concrete sump.

Table 2.3: Asbestos Sampling Locations and Results - Hydrazine Blending and Storage Facility
(Page 1 of 4)

Asbestos Sample No.	Location	Approximate Quantity or Measurement	Asbestos Detected
001	Elbow inside Building No. 1 on southwest corner of site	40–45 elbows and tees	Yes
002	Straight run of 2-inch-diameter pipe from inside of Building No. 1	7 feet	Yes
003	Pipe lagging 2 feet above elbow on pipe in between two buildings on southwest corner of site	210 feet	Yes
004	Elbow in between two buildings	1	Yes
005	Pipe lagging 1 foot above elbow	100 feet from west fence	Yes
006	"T" on pipe lagging on east side of Building No. 1 left pipe looking west	1	Yes
007	"T" Building No. 1 right pipe looking west	1	Yes
008	Pipe lagging on lower left pipe looking west	160 to 170 feet	Yes
009	Pipe lagging on lower right pipe looking west	160 to 170 feet	Yes
010	Pipe lagging on upper left pipe looking west	160 to 170 feet	Yes
011	Pipe lagging on upper right pipe looking west	160 to 170 feet	No
012	Elbow from upper right pipe looking west	15 to 16 tees and elbows	Yes
013	Looking from entrance at loading dock, 2-1/2-inch-diameter pipe coming up from ground on right side	10 feet	No
014	Pipe lagging from pipe running over entrance road	60 to 70 feet	No

Table 2.3: (Page 2 of 4)

Asbestos Sample No.	Location	Approximate Quantity or Measurement	Asbestos Detected
015	Elbow lagging from pipe running over entrance road	2	No
016	Pipe lagging from pipe running over entrance road	60 to 70 feet	Yes
017	Elbow lagging from pipe running over entrance road	2	No
018	Pipe lagging		Yes
019	Elbow lagging	2	No
020	Pipe lagging	60 to 70 feet	Yes
021	Elbow lagging	2	No
022	Pipe lagging	60 to 70 feet	Yes
023	Elbow lagging	2	No
024	Pipe lagging	60 to 70 feet	Yes
025	Elbow lagging	2	No
026	Pipe lagging	60 to 70 feet	No
027	Holding Tank No. 1	12-foot height by 50-foot length by 3- to 5-inch-thick	No
028	Holding Tank No. 2	12-foot height by 50-foot length by 3- to 5-inch-thick	No
029	Holding Tank No. 3	12-foot height by 50-foot length by 3- to 5-inch-thick	No

Table 2.3: (Page 3 of 4)

Asbestos Sample No.	Location	Approximate Quantity or Measurement	Asbestos Detected
030	Holding Tank No. 4	12-foot height by 50-foot length by 3- to 5-inch-thick	No
031	Holding Tank No. 5	12-foot height by 50-foot length by 3- to 5-inch-thick	No
032	Holding Tank No. 6	12-foot height by 50-foot length by 3- to 5-inch-thick	No
033	Elbow on top of holding tank	200 to 300	Yes
034	Pipe lagging from top of tanks	1500 to 2000 linear feet	No
035	Valve insulation from loading area	30	Yes
036	Pipe lagging from loading area	2000 to 2500 linear feet	No
037	Valve insulation from loading area	30	Yes
038	Pipe lagging above No. 37	-	No
039	Pipe lagging from loading area	-	Yes
040	Elbow from loading area	Approximately 100 to 200	Yes
041	Pipe lagging in between loading area and buildings in southwest corner	210 feet	Yes
042	Pipe lagging in between loading area and buildings in southwest corner	210 feet	Yes
043	Pipe lagging in between loading area and buildings in southwest corner	210 feet	No

Table 2.3: (Page 4 of 4)

Asbestos Sample No.	Location	Approximate Quantity or Measurement	Asbestos Detected
044	Pipe lagging in between loading area and buildings in southwest corner	210 feet	No
045	Elbow from scalehouse	10 to 15 feet	No
046	Foam insulation on small tank	-	No
047	Foam insulation on second largest tank	-	No
048	Foam insulation on large tank	-	No

Table 2.4: Inventory as of November 6, 1990 - Pump House (Building 755)

Item	Quantity
55-gallon ethylene glycol drum (empty)	1
40-gallon hot water heater	1
55-gallon drum hand pump	1
Small electronic transformer	1
Gas mask canisters	3
Box of chemical organic cartridges	1
Case of half-face respirators	1

Table 2.5: Inventory as of November 6, 1990 - Maintenance House (Building 759)

Item	Quantity
100-pound bag Vermiculite	2
Miscellaneous clothing and debris	1
Large box of fiberglass insulation for pipe	3
Miscellaneous piping equipment	1

Table 2.6: Inventory as of November 6, 1990 - South Metal Building (Building T-868-C)

Item	Quantity
Case of fiberglass insulation pipe rolls	1
100-pound bag solar salt for water conditioner	1
10-pound bag Vermiculite	1

2.7 DEBRIS

Debris at the site consists of wooden pallets, railroad ties, and other miscellaneous trash. Approximately 20 cubic yards of debris will require disposal as a sanitary waste.

During December 1989 and January 1990, surficial refuse from the west area of the HBSF, including but not limited to hoses and used personal protective equipment (PPE), was placed in 55-gallon drums and transferred to storage in Warehouse 786. Motors and motor parts found during this debris cleanup operation were stockpiled for recycling. Windows and doors in the buildings in the west area were boarded and sealed to prevent unauthorized entry. Wood pallets were sampled and placed in a roll-off container lined with plastic. The top of the roll-off container was then sealed with a liner of plastic and plywood clamped to the roll-off container. The wood samples were analyzed for Extraction Procedure for Toxicity Characteristic (EPTOX) pesticides and EPTOX metals to comply with landfill disposal requirements. Analytical results received on March 2, 1990, indicated that the above-mentioned analytes were not detected.

2.8 DRUMS

After the initial site inventory and collection of surficial refuse, 257 55-gallon drums were removed from the HBSF during January 1990 and transferred to storage in Warehouse 786. The 17 drums containing the ethylene glycol drained from the antifreeze/coolant systems were also transferred at this time. Table 2.7 describes the drum sizes, materials, quantities, and contents. One 30-gallon stainless-steel drum of hydrazine was also identified, placed in an overpack drum, and relocated to Warehouse 786.

2.9 CONCRETE AND ASPHALT

Concrete at the site consists primarily of secondary containment for aboveground tanks, loading area pads, a drum storage pad, the in-ground sump, and fire protection vaults. Asphalt at the west area of the site consists of the road surfaces of the driveway, truck turnaround area, and the area between the loading area and the South Metal Building. These materials will be removed during decommissioning of the HBSF.

Table 2.7: Summary of Drums Transferred from the HBSF to Warehouse 786

Size	Material/Type	Quantity	Suspected Contents	Amount
55 gallon	polyethylene	20	Condensation/residual ethylene glycol antifreeze	< 1/4 full
55 gallon	polyethylene	6	Possibly condensation/residual ethylene glycol	< 1/4 full
55 gallon	polyethylene	21	Condensation/residual propylene glycol	< 1/4 full
55 gallon	polyethylene	15	Empty	-
55 gallon	stainless steel	169	Empty	-
55 gallon	stainless steel	1	Unknown liquid	1/4 full
55 gallon	closed top	1	Well water	1/3 full
55 gallon	17H	16	Surficial debris	full
55 gallon	17H	4	Gasoline-contaminated soil	full
55 gallon	17H	1	Overpacked waste	unknown
55 gallon	17H	1	Surficial debris	unknown
55 gallon	17H	1	Personal protective equipment	unknown
55 gallon	17H	1	Possibly ethylene glycol	1/2 full
300 gallon	polyethylene	8	Ethylene glycol	full
550 gallon	polyethylene	9	Ethylene glycol	full
30 gallon	stainless steel	1	Hydrazine	unknown

3.0 PLAN OF ACTION

Decommissioning of the HBSF will address the 36 specific decommissioning activities described in the Final Decision Document (Table 3.1) and will include (1) cleaning or decontamination of contaminated drums, piping, structures, tanks, the in-ground concrete sump, and secondary containment structures associated with various tanks at the HBSF, (2) demolition of aboveground piping, structures, tanks, buildings, fences, power poles, railroad tracks and support ties, asphalt, and concrete surfaces, (3) excavation and demolition of in-ground concrete secondary containment structures and the in-ground concrete sump, (4) removal of asbestos and other insulation, (5) removal of underground piping and conduits, (6) transport and disposal of decommissioned materials to hazardous and nonhazardous waste disposal facilities, and (7) site reclamation. Worker health and safety measures implemented during decommissioning will be in accordance with ARARs identified in the Final Decision Document.

3.1 TRANSFER OF UNTREATED WASTEWATER

The hydrazine wastewater currently stored in tanks US-3, US-4, and the in-ground concrete sump will be removed before the tanks are decontaminated, dismantled, and disposed. If it is decided to transfer the hydrazine rinsewater to the Pond A surface impoundment for Basin F liquids, temporary holding tanks for the rinsewater will not be necessary. The rinsewater will be transferred via tanker trucks directly from the in-ground concrete sump, tank US-3, and tank US-4 to the Pond A surface impoundment for holding before ultimate treatment and disposition. The decision is being considered as part of the Proposed Amendment to the Final Decision Document, issued to the OAS on February 25, 1991 (HLA, 1991). The Implementation Document for Treatment and Disposal (Phase II) will be issued following issuance of the Amendment to Final Decision Document.

If sludge is encountered on the bottom of tanks US-3, US-4, or the in-ground concrete sump, it will be consolidated in one location, sampled, and analyzed for the list of target parameters specified under the Toxicity Characteristic (TC) rule by the Toxicity Characteristic

Table 3.1: Dismantling and Demolition Plan Tasks
(Page 1 of 2)

1. Demolish Building 760 leaving the floor slab, which will be removed with the nonseverable equipment.

2. Demolish Building 759 leaving the floor slab, which will be removed with the nonseverable equipment.

3. Demolish piping and eight stanchions between Buildings 759 and 755. Stanchions will be cut at ground level and the footings removed. Remove and crush drums located near the truck turnaround.

4. Demolish Building 868 leaving the floor slab, which will be removed with the nonseverable equipment.

5. Demolish piping and 5 stanchions between the west fence and Building 755. Stanchions will be cut at ground level and the footings removed.

6. Demolish Building 755 leaving the floor slab, which will be removed with the nonseverable equipment, including disposal of miscellaneous debris located inside the building.

7. Demolish piping and the 16 stanchions between Building 755 and the hydrazine loading area. Stanchions will be cut at ground level and the footings removed.

8. Demolish fire protection piping and 12 support stanchions located over the railroad loading facility. Support stanchions are bolted to a concrete slab and, hence, do not have foundations.

9. Demolish miscellaneous equipment in the hydrazine blender area, including the blender, scrubber, drum filler, loading arms, and surrounding miscellaneous debris.

10. Demolish the railroad loading and truck loading platforms in the hydrazine blender area.

11. Demolish piping and 28 support stanchions between the hydrazine blender and the horizontal storage tanks, including removal of stairs, handrails, and metal grating attached to the stanchions. Stanchions are bolted to concrete foundations, which will also be removed.

12. Demolish horizontal storage tank HAS-1. This includes removal of the fire deluge sprinkler system and stripping the insulation.

13. Demolish horizontal storage tank HAS-2.

14. Demolish storage tanks US-1 and US-2.

15. Demolish horizontal storage tank HAS-3.

16. Demolish horizontal storage tank CS-1.

17. Demolish the fire protection deluge system over tank US-4 (200,000 gallons).

18. Strip polyurethane insulation from tank US-4 and dismantle.

19. Demolish the fire protection deluge system over tank US-3 (50,000 gallons).

20. Strip polyurethane insulation from tank US-3 and dismantle. Remove all aboveground structural steel, pumps, and piping from the transfer pit.

21. Demolish and remove the concrete bermed area around tank US-3 and the concrete transfer pit. Backfill area to grade with noncontaminated soil.

22. Demolish and remove the concrete bermed area around tank US-4. Backfill area to grade with noncontaminated soil.

23. Remove miscellaneous concrete pads and structures: nitrogen pad, emergency eyewash pad, and the fire protection valve pit and outside debris. Backfill any remaining depressions with noncontaminated soil.

24. Demolish piping and 19 support stanchions connecting tanks US-3 and US-4 to US-1 and US-2. The stanchion foundation will be removed to a depth of 3 feet below ground surface and backfilled with uncontaminated soil.

25. Demolish and remove the concrete berms around tanks HAS-1, HAS-2, HAS-3, and US-1 and US-2. Backfill area to grade with noncontaminated soil.

26. Demolish and remove the concrete fire protection valve pit and backfill with noncontaminated soil.

27. Remove and dispose 120 feet of railroad track and ties from the hydrazine blender pad. Remove the underlying drainage piping below the pad.

28. Demolish and remove the concrete slabs for Buildings 755, 868, and 759. Remove underlying drainage piping below these slabs.

29. Remove underground piping in the east and west areas. This includes drainage lines, potable water lines, fire protection lines, and the change house septic tank and leach field.

30. Remove buried conduits located in the east and west areas.

31. Remove aboveground electrical conduits, poles, and transformers located in the east and west areas.

32. Remove the pavement for the truck turnaround and other pavement in the west area.

33. Demolish and remove the in-ground concrete tank or waste sump. Backfill area to grade with noncontaminated soil.

34. Demolish and remove the drum storage pad, with underlying piping and backfill to grade with noncontaminated soil.

35. Remove the interior chain-link fences around the east and west areas.

36. Remove the exterior barbed-wire fences around the east and west areas.

Source: Ebasco Services, Incorporated, 1988, Final Report: Hydrazine Blending and Storage Facility Wastewater Treatment and Decommissioning Assessment, Version 3.1, June.

Leaching Procedure (TCLP). The ignitability, reactivity, and corrosivity of the sample will also be evaluated. An evaluation of the sludge will be conducted to determine if it is a hazardous waste and, if determined to be a hazardous waste, to assess whether it contains a listed waste. If the sludge is not listed and passes the TC rule, the sludge will be disposed in an appropriate solid waste disposal facility. If the sludge is listed or fails one of the four characteristics that must be considered in classifying a material as hazardous waste, treatability studies for best demonstrated available technology (BDAT) may be conducted. The treated material will then be sampled and analyzed for toxicity, ignitability, corrosivity, and reactivity to evaluate final disposition.

3.2 DECONTAMINATION OF TANKS AND PIPING

Cleaning or decontamination of structures, piping, tanks, and other equipment will be necessary before their dismantlement and disposal. Decontamination of piping, pumps, tanks, and other facilities is described in this section.

Before a decontamination technique is selected for use, the decommissioning contractor should review these decontamination considerations:

- Previous decontamination
- Reason for the decontamination
- Type of surface to be decontaminated and amount of residue present
- Decontamination equipment
- Material compatibility

The rationale for the decontamination will have an important bearing on the decontamination technique selected. If the component is to be decontaminated for scrap, a more thorough decontamination technique will be used. If gross contaminant reduction before hazardous waste disposal is the reason for decontaminating a component, a more economical and less time-consuming decontamination technique may be used.

When a chemical decontamination technique is used, the compatibility of the chemical with the materials of construction of the surface to be decontaminated must be acceptable. Some

contaminant residues may have to be neutralized, stabilized, or removed before demolition activities to prevent explosions or emissions. If the materials of construction exhibit unsatisfactory corrosion response during decontamination, either different decontamination chemicals or a different decontamination technique will be selected. Use of chlorine for decontamination will be avoided because of its oxidizing capability and potential to create byproducts.

Considering safety, critical path schedule, and decommissioning task sequence, decontamination activities will be performed before the removal of insulation. Although piping and tanks at the HBSF were reportedly flushed several years ago after the facility was closed, remaining concerns relative to the decontamination approach include the following:

- Asbestos insulation removal subcontractor employees are typically not trained in hazardous chemical handling.
- Basic asbestos protective clothing will provide little, if any, protection from hydrazine wastewater vapors or liquids.
- Real-time air monitoring for hydrazine fuel compounds may not provide timely detection for unprotected workers.
- Liquids or sludges could become dislodged from weak piping or pipe fittings.

The decommissioning contractor will open, drain, and flush the aboveground piping using the following methods:

1. Isolate piping "runs" using existing valving
2. Open piping to evaluate whether liquids are present
3. Calculate the approximate liquid volume in the run on a worst-case basis
4. Exercise care to minimize disturbance of piping insulation during breaking, draining, and flushing
5. Address decontamination of associated fittings, valves, and hoses attached to a "run" of piping with the appropriate "run"
6. Proceed with pipe decontamination activities at the HBSF from west to east

The decommissioning contractor will utilize potable water as rinsewater and a 10 percent solution of hydrogen peroxide as the decontamination solution. These fluids will be contained

separately before decontamination. For reasons of hazard reduction and ultimate piping decontamination, the line flushing/triple-rinse sequence should be as follows:

1. Potable water rinse
2. 10 percent hydrogen peroxide solution
3. Potable water rinse

Using the established piping color-code system identified in Section 2.0, the decommissioning contractor will verify the type of materials transported through each pipeline. The following activities will also be conducted:

- Attach identification tags to each line
- Evaluate break points/lengths to assist in the flushing process

A valve or tap will be attached to the piping to be decontaminated to allow for pumping of the rinsewater through the piping. A valved discharge hose will be attached to the pipeline to direct the contaminated rinsewater to a collection container. The decontamination solution will be introduced by pumping into each pipeline. A technician will monitor the collection container to prevent spillage.

The aboveground storage tanks will be decontaminated remotely using a high-pressure tank cleaning system. The contaminated rinsewater will be drained using a skid-mounted vacuum cleaning system.

Rinsewater generated from decontamination processes will be temporarily stored in containers meeting the substantive requirements of the Resource Conservation and Recovery Act (RCRA) and transferred via tanker trucks to the Pond A surface impoundment for treatment and disposal.

Real-time air monitoring will be conducted during activities when the potential for encountering hydrazine vapors exist. Nitrogen gas will be used to displace air in tanks and piping where minimizing the potential of explosion may be of concern during flushing activities.

3.3 DEMOLITION

At the completion of the decontamination phase, demolition operations will begin. The demolition phase of the project may be divided into four major areas, as follows:

1. Tanks
2. Piping and pipe support systems
3. Concrete and asphalt
4. Buildings and miscellaneous

The first step in tank dismantlement will be the removal of tank insulation. Tank jackets, where applicable, will be cut off. The blown insulation will be removed via manual scraping, and the scrapings will be vacuumed. The jackets and insulation will be containerized for disposal in a sanitary landfill.

When the tanks are free of insulation, the horizontal tanks in the west area will be lifted by crane from their respective saddles and staged on existing asphalt for hydraulic shearing.

Becaue of their large diameter, the vertical tanks in the east area will probably require a different technique for demolition than the west area tanks. The top of tanks US-3 and US-4 will be removed first. When the top is removed, "V" notches will be cut into each tank to a height that is accessible to hydraulic shears mounted on an excavator. The remainder of each tank will be dismantled by hydraulic shearing.

Following triple rinsing, aboveground piping will be dismantled for disposal as nonhazardous waste. Various cold-cutting techniques may be used for dismantling aboveground piping. These methods include four-wheeled pipe cutters, hydraulic shears, sawz-alls, demolition saws, and ripping guns. The piping will be cut into manageable pieces and containerized for metal reclamation.

As piping is removed, the associated piping support stanchions will also be demolished. Structural and support steel will be torched or hydraulically cut for metal reclamation. Concrete footings will be staged separately for disposal.

As the demolition work proceeds and access to concrete pads, foundations, and berms is available, concrete breaking and asphalt removal operations will commence. Various types of equipment may be used for demolition of concrete and asphalt, including hydraulic breakers or stompers, saws, tracked loaders equipped with buckets, and scrap grapplers. Concrete and asphalt will be staged separately for transportation to recyclers or disposal in a hazardous waste landfill.

Demolition will also include the buildings, loading areas, blending area, fencing, railroad tracks, and other small items not specifically addressed in other demolition activities. Techniques utilized in demolition of these facilities will be consistent with those used for demolition of tanks, piping, and asphalt.

3.4 EXCAVATION AND DEMOLITION OF BURIED FACILITIES

The buried piping and conduit will be triple-rinsed, excavated, removed from the trench, and dismantled utilizing the same techniques as those proposed for aboveground piping. Following triple rinsing, buried piping will be disposed as a nonhazardous waste. Trenches exposed during excavation of buried piping will be backfilled with material acceptable for compaction and compacted to 85 percent to 90 percent of maximum dry density as determined by ASTM-D698. Soil surrounding buried piping will not be screened or sampled because remediation of soil is beyond the scope of this IRA. Buried concrete structures will be excavated, broken, and staged using techniques similar to those proposed for aboveground concrete. Fate of soil excavated in conjunction with these activities will be in accordance with the 1985 EPA Region VIII guidelines.

3.5 REMOVAL OF ASBESTOS INSULATION AND OTHER INSULATION

The majority of the asbestos-containing insulation is located around piping tees and elbows. The decommissioning contractor will collect and analyze additional personnel samples, area samples, and bulk samples to further define the presence of asbestos insulation during decommissioning. Asbestos-containing insulation will be removed utilizing a dry removal technique. The dry removal technique will be demonstrated to Colorado Department of Health (CDH) and EPA

personnel during decommissioning. Asbestos material will be disposed in containers of sufficient strength to avoid being crushed during operations in the landfill.

Foam insulation is located on tanks US-3 and US-4 as well as on many straight runs of piping at the HBSF. This insulation will be removed by scraping methods, vacuumed, and containerized for disposal at an appropriate facility.

3.6 TRANSPORT AND DISPOSAL

Stockpiled hazardous materials and hazardous waste will be transported and disposed at an approved Class I disposal facility. Uncontaminated material will be disposed at a sanitary landfill.

The concrete floors of the secondary containment areas under tanks HAS-1, HAS-2, HAS-3, CS-1, US-1, US-2, US-3, and US-4 will be considered hazardous unless sampling and analysis indicates otherwise. The entire in-ground concrete sump will be considered hazardous. These items will be disposed at a Class I disposal facility. A hazardous waste determination will be performed on remaining concrete pads, stanchion supports and foundations, building support foundations and footings, asphalt paving, and other demolition debris proposed to be disposed in a sanitary landfill. The prospective disposal facility location will be provided to the Organizations and State after a determination has been made concerning the extent to which these materials are nonhazardous.

Nonhazardous waste that is salvaged will be transported to a local scrap dealer for processing. A total of 322 tons of material is estimated to be available for processing as scrap. Trucks will be brought to the site on an as-needed basis for loading. Items assumed to be available for processing by a scrap dealer include:

- Piping
- Structural steel and bracing
- Corrugated metal sheeting
- Railroad rails
- Miscellaneous metal equipment

3.7 REMOVAL OF PCB-CONTAMINATED TRANSFORMERS

According to the Final Decision Document, of the five transformers at the HBSF, only one contains PCB-contaminated oil in the 50 to 500 ppm range. The additional small electronic transformer listed in Table 2.4 will be tested for PCB-contaminated oil. If the oil contains PCBs in the 50 to 500 ppm range, the oil will be drained and disposed pursurant to 40 Code of Federal Regulations (CFR) Section 761.60(a)(2) or (3).

3.8 SITE RECLAMATION

Site reclamation will consist of (1) backfill and compaction in those areas where buried piping and structures were removed, (2) minimal grading to promote drainage, and (3) seeding with native vegetative grasses to establish native vegetative cover. The areas backfilled during decommissioning will be detailed on record drawings for the decommissioning of the HBSF site. Physical properties for the soil used for backfilling will be available with respect to compaction of backfill material. Borrow material will be obtained from an offsite clean source. The seeding work will consist of furnishing and spreading fertilizers, soil preparation, and furnishing and drilling seed in general accordance with specifications for such work developed and utilized by the U.S. Soil Conservation Service.

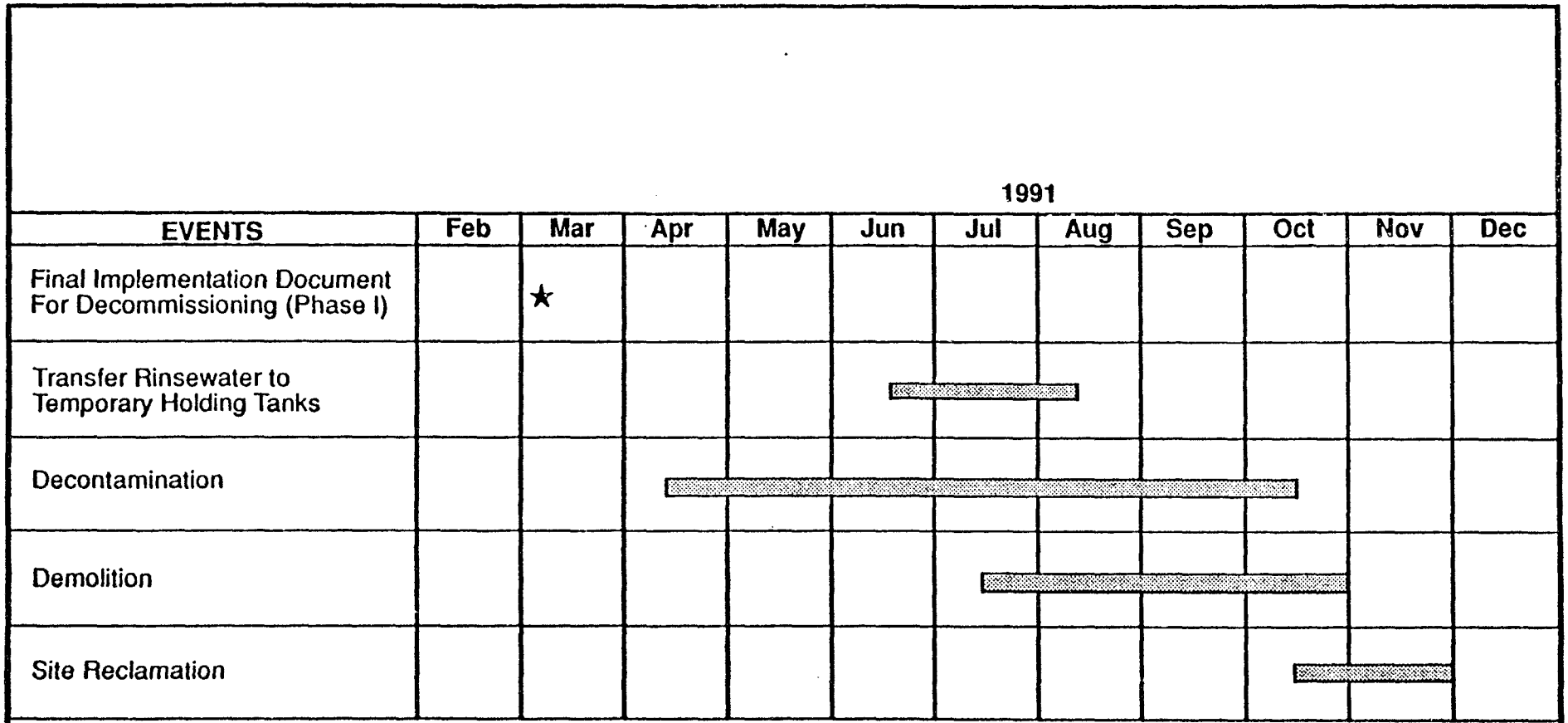
3.9 DOCUMENTATION

Existing record drawings for the HBSF will be used to conduct decommissioning activities. During decommissioning, the contractor will maintain a record of activities on a set of existing HBSF record drawings. At the completion of site reclamation, the contractor will submit to PMRMA a set of record drawings documenting conditions at the site after decommissioning.

3.10 SCHEDULE

A schedule of the major decommissioning activities is shown in Figure 3.1. Based on the issuance of the Final ID for decommissioning, Phase I is expected to be concluded by December 1, 1991.

RMAH 1026



Prepared for:
Program Manager for
Rocky Mountain Arsenal

Figure 3.1

DECOMMISSIONING SCHEDULE – IRA H PHASE I

3.11 COSTS

The following cost estimate was developed for implementation of decommissioning activities:

Activity	Cost
Planning	$ 97,700
Decontamination	657,100
Demolition	2,655,000
Asbestos, insulation removal	321,000
Transport and disposal	305,800
Site reclamation	524,600
Air monitoring	304,700
Administration and support	89,700
	$ 4,955,600

4.0 LIST OF ACRONYMS AND ABBREVIATIONS

ACM	Asbestos-containing material
ARARs	applicable or relevant and appropriate requirements
Army	U.S. Department of the Army
CRL	Certified Reporting Limit
DHHS	U.S. Department of Health and Human Services
DOI	U.S. Department of the Interior
DOJ	U.S. Department of Justice
Ebasco	Ebasco Services Incorporated
EPA	U.S. Environmental Protection Agency
EPTOX	Extraction Procedure for Toxicity Characteristic
FFA	Federal Facility Agreement
HBSF	Hydrazine Blending and Storage Facility
HDPE	high-density polyethylene
HLA	Harding Lawson Associates
ID	Implementation Document
IRA	interim response action
IRA H	RMA IRA Task H for HBSF
MMH	monomethyl hydrazine
NDMA	n-nitrosodimethylamine
OSHA	U.S. Occupational Safety and Health Administration
PLM	polarized light microscopy
PMRMA	Program Manager for Rocky Mountain Arsenal
PPE	personal protective equipment
ppm	parts per million
PVC	polyvinyl chloride
RMA	Rocky Mountain Arsenal

UDMH	unsymmetrical dimethyl hydrazine
USAF	U.S. Air Force
UV	ultraviolet

5.0 REFERENCES

Ebasco Services Incorporated, 1988, Final Decision Document for the Interim Response Action at the Rocky Mountain Arsenal Hydrazine Blending and Storage Facility, October.

Harding Lawson Associates, 1989, Final Task Plan, HBSF IRA Implementation, August 30.

Harding Lawson Associates, 1991, Draft Final Treatment Report, HBSF IRA Implementation, January 7.

Program Manager for Rocky Mountain Arsenal, 1990, letter from Mr. Donald L. Campbell to Mr. Connally Mears, U.S. Environmental Protection Agency, December 14.

U.S. Environmental Protection Agency, 1985, letter from Mr. Robert L. Duprey to Colonel W. N. Quintrell, U.S. Army Toxic and Hazardous Materials Agency, July 19.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2405

FEB 5 1991

Ref: 8HWM-FF

Kevin Blose, Chairman
RMA Committee
ATTN: AMXMR-PM
Rocky Mountain Arsenal
Commerce City, Colorado 80022-2180

Re: Rocky Mountain Arsenal (RMA)
Hydrazine Blending and Storage
Facility Interim Response Action
Draft Final Implementation
Document for Decommissioning
(Phase I), January 7, 1991.

Dear Mr. Blose:

We have reviewed the above referenced implementation document for this phase of the Hydrazine Blending and Storage Facility Interim Response Action and have the attached comments. We wish to highlight our comments in the following areas:

1. The Decision Document for this IRA provides for the implementation of the Hazard Reduction Plan outlined in the Decommissioning Report, June 1988, including removal of asbestos, PCBs, flammable liquids and ethylene glycol. The Decision Document further requires the disposal of demolition debris and asbestos offsite as contaminated, and the development of an IRA- specific Health and Safety Plan, including chemical hazard identification. Paragraph 22.13 of the Federal Facility Agreement requires the Implementation Document to contain the "final drawings and specifications and the final design analysis and cost estimate." The Implementation Document for this IRA should be expanded to include, or provide reference to, the following sections, as other Implementation Documents do and required by Paragraph 22.13:

   a. IRA Specific Health and Safety Plan
   b. Specifics on wastestream generation and waste management: description and specifications for asbestos abatement, PCBs disposal, and treatment and disposal of decontamination wastewaters generated during the IRA

c. Hazardous Reduction Plan (from the Decommissioning Report, June 1988)
d. IRA Specific Chemical Hazard Identification
e. Contractor Specifications: including the identification of subcontractor work (i.e., asbestos abatement)
f. Drawings

2. Development and implementation of a soils sampling plan to address the identification of past leaks. The remediation of these soils can occur as an additional phase of this IRA or be addressed in the final Record of Decision.

3. Please identify the timing for the opportunity for dispute resolution for each phase of the IRA.

4. Army proposed changes to plans for management of the structures and equipment, ethylene glycol, sludges in the tanks, and the interim storage of the wastewater may be best handled by an explanation of significant differences, and review of ARARs. This matter needs further discussion.

We trust these concerns can be resolved cooperatively, to avoid the need for invoking the dispute resolution process. Our contact on this matter is Linda Jacobson at (303) 294-7093.

Sincerely,

Connally E. Mears
EPA Coordinator for RMA Cleanup

Enclosure

cc: Glenn Tucker, ATSDR
Kathryn Cain, RMA-PMO
Major Larry Rouse, DA
Brad Bridgewater, DOJ
David Shelton, CDH
Jeff Edson, CDH
Vicky Peters, CAGO
Bill McKinney, Shell
George Roe, Shell

RESPONSES TO EPA COMMENTS REGARDING THE HYDRAZINE BLENDING AND STORAGE FACILITY INTERIM RESPONSE ACTION DRAFT FINAL IMPLEMENTATION DOCUMENT FOR DECOMMISSIONING (PHASE I)
January 7, 1991

COVER LETTER

Issues addressed by the U.S. Environmental Protection Agency (EPA) in its cover letter are repeated in the comment sections and will be addressed below for ease of understanding.

GENERAL COMMENT

The Decision Document for this IRA provides for the implementation of the Hazard Reduction Plan outlined in the Decommissioning Report, June 1988, including removal of asbestos, PCBs, flammable liquids and ethylene glycol. The Decision Document further requires the disposal of demolition debris offsite as contaminated, the development of an IRA specific Health and Safety Plan, including chemical hazard identification. Paragraph 22.13 of the Federal Facility Agreement requires the Implementation Document to contain the "final drawings and specifications and the final design analysis and cost estimate." The Implementation Document for this IRA should be expanded to include, or provide reference to, the information provided in other Implementation Documents and required by FFA Paragraph 22.13.

The document does not give or provide reference to very much detail on waste characterization, or on decontamination procedures. The Implementation Document should contain a Hazard Reduction Plan (as provided in the Decommissioning Report). The removal of asbestos, flammable liquids, and hazardous wastes should occur prior to decommissioning of the buildings and the specifics of these removal procedures should be presented in greater detail in the Implementation Document. Tank entry and cleaning should not proceed without a precheck to certify safe entry. This would include the determination of oxygen content and flammable/explosion levels. Such matters should be included in a Project Hazard and Safety Plan, which has not been provided.

Response

Removal of asbestos, polychlorinated biphenyls (PCBs), flammable liquids, and ethylene glycol; disposal of demolition debris offsite as contaminated waste; waste characterization; and decontamination procedures are discussed in responses to specific comments.

A site-specific health and safety plan was prepared during Phase I of this Interim Response Action (IRA) to specifically address construction and operation of the hydrazine wastewater treatment facility (WWTF). A site-specific health and safety plan addressing decommissioning activities is being prepared. The Federal Facility Agreement (FFA) does not require submission of the health and safety plan as part of the implementation document.

The implementation document, with the exception of a cost estimate for implementation of the decommissioning activities, complies with paragraph 22.13 of the FFA. Because the decommissioning involves demolition of existing facilities rather than construction of new facilities, the requirement for design drawings and specifications for new construction as a requirement of paragraph 22.13 of the FFA is not applicable to this phase of the IRA. Existing record drawings for the Hydrazine Blending and Storage Facility (HBSF) will be used to conduct decommissioning activities. During decommissioning, the contractor will maintain a record of demolition activities on a set of existing HBSF record drawings. Subsequent to decommissioning, the contractor will submit a set of record drawings that documents conditions at the site after decommissioning.

With respect to tank entry and cleaning, decontamination of the inside of various tanks will be accomplished using a nitrogen purge and cleaning of the interior of tanks from the exterior using spin-jet cleaning nozzles extended into the tanks from the top of each tank. Cleaning will be performed from top to bottom, and rinsate will be removed from the bottom. It is anticipated that the nitrogen purge will be removed after the completion of the second rinse. It is also anticipated that following the third rinse, individuals will be allowed to access the tanks with acceptable protective measures.

The text has been amended (Section 3.11, page 18) to include the cost estimate for decommissioning, which is included below:

Cost Estimate for Implementation
of Decommissioning Activities

Activity	Cost
Planning	$ 97,700
Decontamination	657,100
Demolition	2,655,000
Asbestos, insulation removal	321,000
Transport and disposal	305,800
Site restoration	524,600
Air monitoring	304,700
Administration and support	89,700
	$4,955,600

SPECIFIC COMMENTS

Specific Comment No. 1

Page 5: Site Inventory, there is no mention of the removal of the septic tank and associated leach field. Please amend the Implementation Document to reflect performance of this task, or provide that it will be handled in a later phase of the IRA or at the ROD.

Response

The septic tank and leach field will be removed as described in item 29 of Table 3.1 of the Final Implementation Document for Decommissioning (Phase I) (Harding Lawson Associates [HLA], 1991).

Specific Comment No. 2

Page 6, second paragraph. There is a discussion on air samples taken within the tanks and analyzed for hydrazine using Draeger tubes. No Draeger tube observations are included for Tank No. US-4. Were no measurements taken in that particular tank? Please clarify.

Response

No Draeger tube readings were conducted for the air space above the liquid level in tank US-4 because previous analysis of the rinsewater stored in tank US-4 indicated the presence of the hydrazine fuel compounds.

Specific Comment No. 3

Page 6, was the glycol analyzed for hydrazines, following draining of the antifreeze/coolant systems? It was EPA's earlier understanding that the ethylene glycol was the Air Force's responsibility; has this changed? Despite the DOD component with responsibility, the Decision Document provided for the offsite disposal of ethylene glycol as part of this IRA. The Implementation Document should thus be changed to reflect such plans for disposal of the ethylene glycol, or an explanation of significant differences, along with an additional ARAR review, may be necessary. Further, please specify if this is a listed waste.

Response

The glycol was not analyzed for the hydrazine fuel compounds. A method for analysis of hydrazine fuel compounds in glycol does not exist. During decommissioning, the glycol will be characterized to determine appropriate offsite disposition. The text has been amended to reflect this. (Note: The Final Assessment Document (Ebasco, 1988) states glycol will probably be incinerated.) Refer to the Memorandum of Understanding (MOU) between the Army and Air Force dated January 25, 1985, for delineation of technical and financial responsibilities.

Specific Comment No. 4

Page 7, are the underground drainage lines that feed into the sumps currently closed? Have these lines been tested for the presence of hydrazines or flushed and decontaminated in the past? Will the above and below ground pipes be rinsed prior to removal?

Response

Valves and/or pumps shown on record drawings for the HBSF that may be used to direct contents of the concrete secondary containments to the in-ground concrete sump are closed or disconnected. The underground drainage lines have neither been tested nor flushed/decontaminated in the past. The aboveground and underground pipes will be triple-rinsed for hydrazine removal and decontamination. The rinsing sequence will be as follows: potable water, 10 percent hydrogen peroxide solution, and potable water.

Specific Comment No. 5

Page 7A, please amend the text to provide details on the removal process for the buried pipe. EPA recommends the underground piping be checked for leaks during this removal, the surrounding soils screened for contamination, and soils sampling soon conducted when contamination is suspected. The contaminated soils remediation can then occur as part of another phase of the IRA, or after the ROD.

Response

Buried piping will be triple-rinsed utilizing the same methodology as for aboveground piping, and removed by excavation. Trenches exposed during excavation of buried piping will be backfilled with material acceptable for compaction and compacted to 85 percent to 90 percent of maximum dry density as determined by ASTM-D698. Soil surrounding buried piping will not be screened or sampled because the Final Decision Document for the HBSF IRA (Ebasco, 1988) states that remediation of soil and ground water is beyond the scope of this IRA. The text has been amended accordingly.

Specific Comment No. 6

Page 8, asbestos is noted to be a contaminant in the insulation around some of the pipes. On page 37, Footnote 8 of the Final Decision Document, the commitment was made to dispose of all asbestos insulation as contaminated with hydrazine, NDMA, UDMH, and MMH. We understand the underground fire protection pipe contains asbestos and determination of the presence of asbestos in the walls and ceiling, around the heat exchanger, and around associated piping needs to be made. A "dry" removal technique was proposed for asbestos removal at the HBSF. In response to EPA's comments on the Proposed Decision Document for this IRA, the Army promised in the Final Decision Document a demonstration of this "dry" removal technique to State of Colorado and EPA personnel. The Final Decision Document further commits to the provision that the bags containing asbestos wastes will not be crushed during landfilling operations. These commitments should be reflected in the Implementation Document.

Response

Specific asbestos sampling locations and associated results are described in Table 2.3 of the Final Implementation Document. The decommissioning contractor will collect and analyze additional personnel samples, area samples, and bulk samples to further define the presence of asbestos insulation during decommissioning. The dry removal technique will be demonstrated to Colorado Department of Health (CDH) and EPA personnel during decommissioning. Also, the Final Assessment Document states that the dry asbestos material should be disposed in containers of sufficient strength to avoid being crushed during operations in the landfill. The text has been amended to reflect both comments. See also the response to State General Comment No. 3.

Specific Comment No. 7

Page 8e. A small electronic transformer is identified in the inventory list for the pump house (Building 755). Has this transformer been checked to determine if it contains PCBs? It was EPA's earlier understanding that the disposal of the PCB transformer oil was to be handled by the Air Force; has this changed? Either way, that remedial action is part of the IRA, and the Implementation Document should address it consistently with the Decision Document.

Response

According to the Final Decision Document, of the five transformers at the HBSF, only one contains PCB-contaminated oil in the 50 to 500 parts per million (ppm) range. The additional small electronic transformer listed in Table 2.4 of the Final Implementation Document will be tested for PCB-contaminated oil. If the oil contains PCBs in the 50 to 500 ppm range, the oil will be drained and disposed pursuant to 40 Code of Federal Regulations (CFR) Section 761.60(a)(2) or (3). The text has been amended accordingly.

Specific Comment No. 8

Page 9, the text states that a 30-gallon drum of hydrazine was overpacked for storage. Was this drum leaking, where was it found, and what are the plans for disposal/treatment of this hydrazine? This remedial action could be part of another phase of the IARA.

Response

A 30-gallon stainless-steel drum labeled "hydrazine" was found at the west end of the HBSF. The drum was not leaking, was placed in an overpack drum, and was relocated to Warehouse 786 at Rocky Mountain Arsenal (RMA). The drum will be transported offsite for incineration.

Specific Comment No. 9

Page 9A, .he text states that 4 full drums of gasoline-contaminated soil was drummed. When did this leak occur, what was the source, and what were the cleanup levels? This remedial action could be part of another phase of the IRA.

Response

Gasoline from a construction vehicle leaked to the ground during construction of the hydrazine WWTF. The soil upon which the gasoline leaked was placed in four drums and relocated to Warehouse 786 at Rocky Mountain Arsenal (RMA). These drums will be transported offsite for incineration or offsite disposal during decommissioning of the HBSF.

Specific Comment No. 10

Page 10, will it be necessary to construct temporary holding tanks for the hydrazine wastewater, if the decision is made to transfer the liquids to Basin F Pond A surface impoundment? If such tanks are constructed, we will need to agree to ARARs and where they will be located, the anticipated size of these holding tanks, and consider the need for an explanation of significant differences, or etc. Is it anticipated that these tanks will be covered? Please clarify.

Response

If it is decided to transfer the hydrazine rinsewater to the Pond A surface impoundment for Basin F liquids, temporary holding tanks for the rinsewater will not be necessary. The rinsewater will be transferred via tanker trucks directly from the in-ground concrete sump, tank US-3, and tank US-4 to the Pond A surface impoundment for holding before ultimate treatment and disposition. The decision is being considered as part of the Proposed Amendment to the Final Decision Document, issued to the OAS on February 25, 1991 (HLA, 1991). The Implementation Document for Treatment and Disposal (Phase II) will be issued following issuance of the Amendment to the Final Decision Document. The text has been amended accordingly.

Specific Comment No. 11

Page 10, the sludge in the tanks is to be tested for characteristic properties, including the TCLP. The sludges should also be tested for the presence of hydrazines, NDMA, and other identified listed wastes present in the hydrazine wastewaters. The sludges should be properly managed and treated for this range of listed wastes, if detected in the samples.

Response

An evaluation of the sludge will be conducted to determine if it is a hazardous waste and, if determined to be a hazardous waste, to assess whether it contains a listed waste.

Specific Comment No. 12

Page 10B, Item 20, reference is made to stripping the polyurethane insulation from tank US-3. The Implementation Document should specify how this will be removed. Prior documents recommended scraping off the insulation (without use of heat and production of fumes), vacuuming up the scrapings, and drumming them, but a decision is now due.

Response

The polyurethane insulation scrapings will be vacuumed from tanks US-3 and US-4 and containerized for disposal. The text has been modified accordingly.

Specific Comment No. 13

Page 11, Section 3.2, Decontamination of Tanks in Piping. The text states "acceptability of wastewater generated with respect to treatment at the WWTF." Is there more specific criteria on acceptability of wastewaters to be treated at the WWTF? Does the Army intend to store the decontamination wastewaters until Phase II of this IRA and treat them then?

Response

Reference to treatment of rinsewater at the hydrazine WWTF has been deleted. Rinsewater generated from decontamination processes will be temporarily stored in containers meeting the substantive requirements of the Resource Conservation and Recovery Act (RCRA) and transferred via tanker trucks to the Pond A surface impoundment for treatment and disposal.

Specific Comment No. 14

Page 11, Section 3.2, third paragraph. The text states, "...if the materials of construction exhibit unsatisfactory corrosion response during decontamination either different contamination chemicals or a different contamination technique will be selected." What would be considered an unsatisfactory corrosion response? Corrosion usually takes place over long periods of time and unsatisfactory corrosion response in most cases would not be noted during decontamination. It may be appropriate to initiate a corrosion testing program now using the known materials of construction for the items to be decontaminated and a matrix of the available decontamination fluids. This approach would allow a more thorough evaluation of an unacceptable corrosion response before decontamination activities commence.

Response

The text has been revised to reflect the decontamination technique that will be utilized. This technique includes triple-rinsing using a sequence of potable water, 10 percent hydrogen peroxide solution, and potable water. No corrosion testing program will be instituted.

Specific Comment No. 15

Page 12 and 13. The text discusses both rinse water and decontamination solution. Are both of these fluids going to be contained separately or are they to be mixed? If they are mixed, how is it going to be determined that they will be acceptable to be treated in the WWTF?

Response

The decommissioning contractor will utilize potable water as rinsewater and a 10 percent solution of hydrogen peroxide as the decontamination solution. These fluids will be contained separately before decontamination. After decontamination they will be mixed in temporary storage facilities and disposed as discussed in the response to EPA Specific Comment No. 13. The text has been clarified.

Specific Comment No. 16

Page 12, during piping decontamination flushes, why is a nitrogen gas purge to be used?

Response

Nitrogen gas will be used to displace air in tanks and piping where minimizing the potential of explosion may be of concern during flushing activities.

Specific Comment No. 17

Section 3.4. How is the buried piping underneath the facility to be disposed of? The Decision Document provided that it would be assumed to be contaminated and the Implementation Document must conform to that.

Response

Buried piping will be decontaminated utilizing the same technique as that utilized for above-ground piping. Following triple rinsing, buried piping will be disposed as a nonhazardous waste.

Specific Comment No. 18

Page 15, Section 3.6, The text states that the "concrete pads, stanchion supports and foundations building support foundations and footings, and asphalt paving" will be "assumed" to be nonhazardous materials. The HBSF Wastewater Treatment and Decommissioning Assessment Final Report, June 1988, stated that "All wastes are considered to be hazardous for disposal." On page 27, the Final Decision Document states: "compacted demolition debris, which for the purposes of this IRA are assumed to be contaminated..." Further, on page 37, Footnote 8 of the Final Decision Document states that "Asbestos insulation, along with other demolition debris, is assumed to be contaminated with hydrazine, NDMA, UDMH and MMH." Without an ESD or etc. for the Decision Document and adequate justification for this variance, the Army must continue to handle the demolition debris as a hazardous waste.

Response

A hazardous waste determination will be performed on debris proposed to be disposed in a sanitary landfill. The text has been amended to indicate as such.

Specific Comment No. 19

Page 15, the text refers to 11/90 PMRMA guidelines for soils management. Please promptly provide us a copy of these guidelines and detail how they differ from the current 1985 EPA

egion VIII Guidelines. Until the parties have reviewed any new soils-handling proposal, the '85 uidance should continue to be followed.

esponse

he reference to the November 1990 PMRMA Guidelines for Soils Management has been deleted. 985 EPA Region VIII guidelines will be followed during decommissioning. As stated in the Final ecision Document, remediation of soil is beyond the scope of this IRA.

pecific Comment No. 20

'age 16, Section 3.7, Site Reclamation. We note that, even though earlier in the document (see 'age 5) it is noted that the secondary containments contain cracks in the floor and that under-round drainage lines were identified (see Page 7), there is no discussion in this document of aking soil samples to check for soil contamination. Further, the HBSF Wastewater Treatment and Decommissioning Assessment Final Report, June 1988, indicates Task 11 soils sampling did not ndicate soils contaminated with NDMA or hydrazines; however, the Decommissioning Report roposes that other potentially contaminated soils may be found "under the concrete bermed areas, he drum storage pad, the truck and rail loading pads, the septic tank, the draining piping...(or in) a 3-inch sand layer underlying tank US-4..." EPA recommends soils sampling prior to back 'illing. EPA recommends the underlying soils be checked for leaks during the decommissioning hase, the surrounding soils screened for contamination, and soils sampling soon conducted when ontamination is suspected. The contaminated soils remediation can then occur as part of another hase of the IRA, or after the ROD.

Response

As stated in the Final Decision Document, remediation of soil is beyond the scope of this IRA. Neither soil investigations nor isolation or treatment of contaminated soil is within the scope of this IRA.

RESPONSES TO STATE COMMENTS REGARDING THE DRAFT FINAL
IMPLEMENTATION DOCUMENT FOR DECOMMISSIONING (PHASE I)
THE HYDRAZINE BLENDING AND STORAGE FACILITY (HBSF)
INTERIM RESPONSE ACTION
January 7, 1991

COVER LETTER

Issues addressed by the State of Colorado (the State) in its cover letter are repeated in the comment sections and will be addressed below for ease of understanding.

GENERAL COMMENTS

General Comment No. 1

The State reiterates its position that any closure activities performed at the Hydrazine Blending and Storage Facility ("HBSF") must be conducted pursuant to a Colorado Department of Health approved closure plan which complies with regulations promulgated pursuant to the Colorado Hazardous Waste Management Act (CHWMA).

The Army has acknowledged that the HBSF Interim Response Action (IRA) constitutes closure of the facility. (See for example, pp. 2 and 3 of the Draft Implementation Document.) It is therefore clear that the closure and post-closure requirements, which apply to owners and operators of hazardous waste management facilities, and are found at 6 CCR 1007-3, pt. 265, subpart G, are applicable to the Army's decommissioning activities at the HBSF. Many of these requirements were acknowledged in the Army's Closure Plan dated December 1985.

In addition to closure requirements referenced above, any new storage, treatment or disposal units must be permitted in accordance with those same hazardous waste laws.

These comments are being submitted without waiving the State's legal position on the independent applicability of RCRA/CHWMA to the HBSF.

Response

The HBSF Interim Response Action (IRA) is being conducted pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The IRA follows the requirements of CERCLA and the National Contingency Plan (NCP). Because the HBSF is being remediated pursuant to CERCLA and is not undergoing "closure" in the Resource Conservation and Recovery Act (RCRA)/Colorado Hazardous Waste Management Act (CHWMA) sense, neither a CHWMA closure plan nor RCRA permits are required.

General Comment No. 2

In this document the Army discusses: the decontamination and disposal of the sump and tanks currently containing hydrazine wastewater; asbestos removal; the dismantling and disposal of buildings and concrete; the construction of temporary tanks for containment of hydrazine wastewater; and the disposal of sludges found in the tanks and elsewhere. The total length of the document is 19 pages. The State strongly objects to the paucity of information that has been provided to the parties on this critical portion of the HBSF IRA. Meaningful input is difficult if not possible when so little information is presented.

In addition, nowhere in the document does the Army provide an ARARs analysis, a Risk Assessment, a Contingency Plan, or a Health and Safety Plan. A revised Draft Implementation Document must be issued. The revised document must describe with specificity all actions to be taken by the Army in this phase of the IRA; identify all applicable or relevant and appropriate requirements; quantify risks associated with these activities; identify procedures to be followed in the event of an emergency; and identify health and safety precautions and contingency plans to minimize risks associated with these activities. This will allow for meaningful involvement by the parties and will help ensure a closure that will, at a minimum, be in substantive compliance with state and federal regulations.

Response

An analysis of applicable or relevant and appropriate requirements (ARARs) was performed as part of the Final Decision Document for the HBSF IRA (Ebasco, 1988). A health and safety plan was prepared for construction and operation of the hydrazine wastewater treatment facility (WWTF) during Phase I of this IRA. A site-specific health and safety plan to address decommissioning of the HBSF is being prepared. The Federal Facility Agreement (FFA) does not require submission of a risk assessment, contingency plan, or health and safety plan as part of the implementation document. The Final Decision Document does not indicate that either a risk assessment or contingency plan will be prepared for decommissioning. Although the Final Implementation Document will be modified on the basis of the comments received from the Organizations and State (OAS), a revised draft implementation document will not be issued. The U.S. Department of the Army (Army) will continue to substantively comply with federal and state regulations.

General Comment No. 3

On page 37 of the Decision Document, footnote 8, the Army says that "asbestos insulation along with other demolition debris is assumed to be contaminated with hydrazine, NDMA, UDMH, and MMH." On pages 4-7 of the Army's Closure Plan the same assumption is made. This assumption is required by at least two provisions of 6 CCR 1007-3:

6 CCR 1007-3, § 262.11 states, "[a] person who generates a solid waste...must determine if that waste is a hazardous waste..." Procedures for determining whether a waste is hazardous are set forth in that provision.

6 CCR 1007-3, § 265.197 states:

> *[a]t closure of a tank system the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.) contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless section 261.3(d) of these regulations applies.*

As is clear from these provisions, the Army cannot "assume" that wastes generated during closure are nonhazardous. It must determine whether they are or are not. If such a determination indicates the presence of listed wastes, and if these wastes cannot be delisted, they must be managed as hazardous waste, and a land-ban analysis must be conducted. Therefore, a sampling and analysis plan must be provided to the parties for review and comment, and the data resulting from such analysis must be shared with the parties prior to ultimate disposition of these materials.

Response

As stated in Section 8.3.3.3 of the Final Decision Document, "The Army intends to dispose of this material in a facility which complies with the standards of 40 CFR Part 264 for disposal of hazardous waste."

General Comment No. 4.a.

The Army, apparently, has continued to ignore significant data gaps in the remedial investigation for the HBSF area (see State's Proposal to Improve the Remedial Investigation for the South Plants Study Area, May 21, 1990). The Army has failed to characterize the distribution of hydrazine and hydrazine-related compounds in the soils and ground water beneath and downgradient of the HBSF. Final closure cannot be certified complete until fill site characterization and remediation is accomplished. The Implementation Document must reflect the Army's commitment to address these other media in future phases of closure.

Response

As stated in the Final Decision Document, remediation of soil and ground water is beyond the scope of this IRA.

General Comment No. 4.b.

Awareness of the levels of contamination in the soils as well as tanks, pipes, structures or other materials is essential not only to determine appropriate closure activities, but also to conduct a risk assessment for activities involving potential exposure to that contamination. It is not clear how the safety of the workers and general public can be ensured without this knowledge.

Response

As stated in the Final Decision Document, soil remediation is beyond the scope of this IRA. A risk assessment for activities will not be conducted. Tanks, pipes, and structures will be decontaminated using a triple-rinse procedure involving potable water, 10 percent hydrogen peroxide solution, and potable water. Real-time air monitoring will be conducted during activities when the potential for encountering hydrazine vapors exists. The text has been amended accordingly.

SPECIFIC COMMENTS

Specific Comment No. 1

Page 5:

> *All of the secondary containment structures for the six horizontal storage tanks were noted to have numerous surficial cracks in the concrete floors and open cracks at the concrete wall construction joints. Cracks at the construction joints were as large as 1/8 inch wide and extended through the secondary containment concrete walls.*

The Army cannot, therefore, assume that soils underlying these structures are uncontaminated. These areas must be clearly staked and slated for future investigation. Final closure must include sampling and analysis of these soils as well as remediation if necessary.

Response

As stated in the Final Decision Document, remediation of soil and ground water is beyond the scope of this IRA.

Specific Comment No. 2

Page 6: The purpose of conducting analysis using only hydrazine-specific Draeger tubes is not clear from the text. Such analysis is not adequate to determine whether the tanks contain hazardous constituents. The Army must assume that these tanks contain hazardous waste and manage them accordingly unless it can provide to the State adequate sampling and analysis data to demonstrate that the tanks are uncontaminated. It should be noted that according to page 3-2 of the Army's December 1985 Closure Plan, fuel and waste water were present in these tanks.

Response

Characterization of the rinsewater contained in tanks US-3 and US-4 and the in-ground concrete sump is documented in the Draft Final Treatment Report for the HBSF IRA (Harding Lawson Associates [HLA], 1991).

Specific Comment No. 3

Page 8E: Table 2.4 lists a "small electronic transformer" as being present in the Pump House (Building 755). Page 10A refers to the "[d]emolition of Building 755 and "disposal of miscellaneous debris located inside the building." No specific mention is made of the transformer.

On page 35 of the Decision Document, the Army refers to an electrical transformer that is known to contain PCB contaminated oil. The Army goes on to identify the Toxic Substance Control Act (TSCA) and associated regulations as ARARs. The Implementation Document, however, does not even acknowledge the existence of PCBs or PCB contaminated transformers at the facility. Please explain this discrepancy. If the transformer in Building 755 (or any other transformer at the facility) contains PCBs, it must be managed in accordance with TSCA.

Response

See response to U.S. Environmental Protection Agency (EPA) Specific Comment No. 7.

Specific Comment No. 4

Page 9: A hazardous waste determination pursuant to § 262.11, along with a Toxicity Characteristic Leaching Procedure (TCLP) analysis must be performed on all debris before it may be disposed of in any sanitary landfill. The wooden pallets, which were previously subjected only to EPTOX, must also undergo such analysis.

Response

A hazardous waste determination will be performed on debris proposed to be disposed in a sanitary landfill. Tlhe text has been amended accordingly.

Specific Comment No. 5

Page 9: According to this page, "[o]ne 30-gallon stainless-steel drum of hydrazine was also identified, placed in an overpack drum, and relocated to Warehouse 786." However, Table 2.7: Summary of Drums Transferred from the HBSF to Warehouse 786, located on page 9A of this document, does not include this item. This mysterious disappearance is extremely troublesome, especially considering the hazardous nature of hydrazine. Storage of such highly toxic and flammable liquid is not appropriate. The Army must transport the hydrazine offpost for reuse at another facility, or appropriate treatment and disposal as soon as practicable. In addition, the contents of all drums listed on Table 2.7, page 9A must immediately undergo thorough hazardous waste determinations as required by Section 262.11.

Response

The 30-gallon stainless-steel drum of hydrazine was inadvertently omitted and has been added to Table 2.7. This drum has always been under proper management and will ultimately be transported to an offsite incineration facility for disposal. The drums listed in Table 2.7 will be categorized before disposal. Information currently available regarding drum content will be used to facilitate the categorization process.

Specific Comment No. 6

Page 10: The Army states that "[w]orker health and safety measures implemented during decommissioning will be in accordance with ARARs identified in the Final Decision Document." As noted in General Comment 2, a detailed Health and Safety Plan and Risk Management must be submitted to each party prior to implementing this closure. Such a submission is required by the Army's Decision Document.

Response

See the response to State General Comment No. 2.

Specific Comment No. 7

Page 10: Contrary to representations made by Katherine Cain and Larry Rouse at recent meetings regarding the disposition of hydrazine wastewater, it is stated in this document that the Army has decided to transfer the 300,000 gallons of wastewater out of U3-3, US-4 and the sump tanks into new storage tanks. However, descriptions or specifications for these tanks are not provided for review. 6 CCR 264, subpart J contains minimum requirements for the construction of any tanks used to store hazardous waste. If the proposed storage tanks are constructed in compliance with legal requirements, they could be used to store wastewater until appropriate decisions regarding the treatment and disposal of the hydrazine wastewater are made. Pursuant to § 262.34(b), storage of this liquid for more than 90 days would require a hazardous waste storage permit to be issued from the Colorado Department of Health. A 30 day extension may be obtained under certain circumstances identified in this provision.

Response

See the response to EPA Specific Comment No. 10.

Specific Comment No. 8

Page 10, paragraph 3: The Army states that if sludge is encountered at the bottoms of tanks US-3 and US-4, or the sump, that the sludge would be consolidated into one location and sampled using the toxicity characteristic leaching procedures (TCLP). Since, the sludge may contain listed wastes, the Army must also perform a hazardous waste determination as required by §§ 262.11.

Response

See the response to EPA Specific Comment No. 11.

Specific Comment No. 9

Page 10-11: The Army discusses disposition of any sludge which may be discovered at the bottom of tanks currently holding Hydrazine wastewater. If, as is likely, the sludge is determined to be hazardous waste, it must be managed in accordance with CHWMA and its implementing regulations. A land-ban analysis will also need to be conducted. The Army must present all treatment alternatives as well as its chosen alternative to the parties for review and comment prior to treatment. A proposal for treatment and disposition could be attached to the Revised Implementation Document as an addendum to avoid delaying release of that document. It should also be noted that if the sludge contains listed hazardous wastes, the treated residuals must also be managed as listed hazardous waste. See 6 CCR 1007-3, § 261.3(c).

Response

The HBSF IRA is being conducted pursuant to CERCLA. The IRA follows the requirements of CERCLA and the NCP. Because the HBSF is being remediated pursuant to CERCLA and is not undergoing "closure" in the RCRA/CHWMA sense, a CHWMA closure plan is not required. See also the response to State Specific Comment No. 8.

Specific Comment No. 10

Page 10B: The Army intends to backfill a number of areas, such as underground piping and the waste sump, with uncontaminated soils. These areas must be clearly identified for future sampling and analysis before being backfilled. See General Comment 4. In addition, the State requests information on the borrow area for the reportedly uncontaminated soil.

Response

The areas backfilled during decommissioning will be detailed on record drawings for the decommissioning of the HBSF site. Physical properties for the soil used for backfilling will be available with respect to compaction of backfill material. Borrow material will be obtained from an offsite clean source. The text has been amended accordingly.

Specific Comment No. 11

Page 10B, Nos. 35, 36: The Army states that it will remove both the interior chain link fences and the exterior barb-wired fences. Before these fences are removed, the Army must complete a certified clean closure under CHWMA. Without clean closure, the fences must remain due to safety concerns for humans and wildlife. See 6 CCR 1007-3, § 265.14.

Response

See the response to State General Comment No. 1 regarding closure.

Specific Comment No. 12

Page 11: The Army states,

> *[i]f the component is decontaminated for scrap, a more thorough decontamination technique will be used. If gross decontamination reduction before hazardous waste disposal is the reason for decontaminating, a more economical and less time consuming decontamination technique may be used.*

The Army has asserted that it is closing the HBSF pursuant to CERCLA; however, the above statement indicates a disregard for § 121 of that statute. CERCLA does not allow the selection of a remedy solely on the grounds of economics. CERCLA § 121(b)(1) requires that:

> *[r]emedial actions in which treatment permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants is a principal element, are to be preferred over remedial actions not involving such treatment. The offpost transport and disposal of hazardous substances or contaminated materials without such treatment should be the least favored alternative remedial action where practicable treatment technologies are available.*

Therefore, maximum treatment prior to disposal is required for these materials unless the Army can demonstrate that such treatment is impracticable. Also land disposal restrictions must be considered.

Response

Tanks, piping, and structures will be decontaminated using a triple-rinsing sequence of potable water, a 10 percent hydrogen peroxide solution, and potable water.

Specific Comment No. 13

Page 11 and 13: The Army refers to the WWTF, or wastewater treatment facility, as the repository for the decontamination liquids. This facility is not identified. Neither the CERCLA wastewater treatment facility, nor the hydrazine wastewater facility is expected to be operational within the next few months and therefore could not be used for this purpose unless the liquids are to be stored in the meantime. However, no provision for storage is mentioned in the document. Disposal into the South Plants Treatment Facility, on the other hand, would violate the Army's NPDES permit for that outfall. Please clarify the Army's intention regarding disposition of these liquids.

Response

See the response to EPA Specific Comment No. 10.

Specific Comment No. 14

Page 12: The Army identifies a number of serious concerns relative to the decontamination efforts and the health and safety of workers engaging in those efforts, for example, "Real-time air monitoring for hydrazine fuel compounds may not provide timely detection for unprotected workers." No proposed solutions for these disturbing problems are even discussed, however. This is unacceptable. An adequate Health and Safety Plan must be developed prior to commencement of the work.

Response

See the response to State General Comment No. 2.

Specific Comment No. 15

Page 14: Tank jackets and insulation will be removed and containerized for disposal in a sanitary landfill Before these materials can be disposed of, they must undergo a complete hazardous waste determination. See also General Comment 3.

Response

See the response to State General Comment No. 3.

Specific Comment No. 16

Page 15: "The fate of soil excavated in conjunction with these activities will be in accordance with current PMRMA guidelines (PMRMA, November 1990)." What are these guidelines? If the Army is referring to its proposal dated November 19, 1990 regarding its "Waste Minimization Program," those procedures are the subject of on-going discussion and have not yet been approved. Reliance on those guidelines is therefore inappropriate.

Response

The reference to the November 1990 PMRMA Guidelines for Soils Management has been deleted. 1985 EPA Region VIII guidelines will be followed during decommissioning. As stated in the Final Decision Document, remediation of soil is beyond the scope of this IRA.

Specific Comment No. 17

Page 15: Before reclaiming or torching any steel recovered from the HBSF, it must be decontaminated or conclusively determined to be nonhazardous.

Response

Any steel proposed for salvage during HBSF decommissioning activities will be decontaminated as discussed in the response to State General Comment 4.b. The text has been amended accordingly.

Specific Comment No. 18

Page 15: The Army states that

> *[r]emaining concrete pads, stanchion supports and foundations, building support foundations and footings, and asphalt paving will be assumed nonhazardous and disposed at an appropriate facility located in proximity to the project site.*

The "appropriate facility," (according to the Army) is not identified. Unless these materials are legally determined to be nonhazardous in compliance with 6 CCR 1007-3, § 262.11, no appropriate on-site facility exists. In the event these materials are determined to be nonhazardous, however, the prospective location of the disposal facility must be provided to the parties for review and comment.

Response

The text has been amended to state that the prospective disposal facility locations will be provided to the OAS after a determination has been made concerning the extent to which these materials are nonhazardous.

Specific Comment No. 19

Page 15: According to the Implementation Document, "Asbestos-containing insulation will be removed utilizing the glove bag method." In its Decision Document, however, the Army states that it will use a dry asbestos removal technique that "will be demonstrated to EPA Region VIII and Colorado Department of Health personnel prior to implementation." This apparent discrepancy must be clarified in the text.

Response

The text has been amended to state that the Army will use a dry asbestos removal technique, which will be demonstrated to EPA and the Colorado Department of Health (CDH) personnel before implementation.

Specific Comment No. 20

Page 15: The Implementation Document says that asbestos will be containerized "for disposal at an appropriate facility." Again, "appropriate facility" is not defined. On page 37 of the Decision Document, footnote 8, the Army says that "asbestos insulation along with other demolition debris is assumed to be contaminated with hydrazine, NDMA, UHMH, and MMH." This assumption should be clearly reflected in the Implementation Document. In the alternative, a hazardous waste determination may be performed.

Response

Table 3-9 of the Final Assessment Document (Ebasco, 1988) lists five permitted hazardous waste landfills considered "appropriate facilities" for hazardous water disposal. Uncontaminated material will be disposed at a sanitary landfill. The text has been clarified.

Specific Comment No. 21

Figure 3.1: The schedule reflected in this figure indicates that the Army intends to transfer wastewater to temporary holding tanks by mid-March. This is totally inconsistent with representations made at recent hydrazine wastewater IRA meetings. At those meetings parties were informed that decisions regarding disposition of the wastewater would have to be made immediately to enable the Army contractors to dismantle Tanks US 3 & 4 and the sump by August 1991. This inconsistency must be clarified.

The schedule presented in this document also contradicts that set forth in the Army's primavera planning document which states that decommissioning of the HBSF is anticipated to be completed no earlier than August of 1992. In view of this schedule, it is difficult to understand the urgency recently communicated by the Army regarding this IRA.

Response

The schedule in Figure 3.1 has been corrected to show a mid-Summer 1991 transfer of the rinsewater and late Summer dismantling of tanks US-3 and US-4 and the in-ground concrete sump.